

TEST REPORT

Application No.:	KSCR2412002452AT
FCC ID:	M82-UTK3000
IC:	9404A-UTK3000
Applicant:	Advantech Co., Ltd.
Address of Applicant:	No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114, Taiwan
Manufacturer:	Advantech Co., Ltd.
Address of Manufacturer:	No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114, Taiwan
Equipment Under Test (EUT):	
EUT Name:	Self-service terminal
Model No.:	UTK-3000, UTK-3XXXXXXXXXXXXXXX, UTK3XXXXXXXX XXXXXXXXX(X=0-9, a-z, "-" or black, indicating different sales regions, the change of X not affect the safety performance and EMC performance of the product) *
For IC Model No.:	UTK-3000
•	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Standard(s) :	47 CFR Part 15, Subpart C 15.225 RSS-210 issue 11 RSS-Gen Issue 5, April 2018, Amendment 2
Date of Receipt:	2024-12-02
Date of Test:	2024-12-06 to 2025-01-03
Date of Issue:	2025-01-07

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Revision Record			
Version	Description	Date	Remark
00	Original	2025-01-07	/

Authorized for issue by:			
Tested By		<i>Maker Qi</i>	
		Maker Qi /Project Engineer	
Approved By		<i>Terry Hou</i>	
		Terry Hou /Reviewer	

2 Test Summary

Radio Spectrum Technical Requirement						
Item	Standard	Method	Requirement	Requirement	Result	Test Lab*
Antenna Requirement	47 CFR Part 15, Subpart C 15.225; RSS-210 issue 11	N/A	47 CFR Part 15, Subpart C 15.203	RSS-Gen Section 6.8	N/A	N/A

Radio Spectrum Matter Part						
Item	Standard	Method	Requirement	Requirement	Result	Test Lab*
Conducted Emissions at AC Power Line (150kHz-30MHz)		ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.225(a)&(b)&(C)	RSS-Gen Section 8.8	Pass	B
20dB Bandwidth		ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.215	-	Pass	A
99% Bandwidth		RSS-Gen March 2019 Amendment 1 Section 6.7	-	RSS-Gen Section 6.7	Pass	A
Emission Mask	47 CFR Part 15, Subpart C 15.225; RSS-210 issue 11	ANSI C63.10 (2013) Section 6.4	47 CFR Part 15, Subpart C 15.225(a)&(b)&(C)	RSS-210 B6 (a)	Pass	A
Frequency tolerance		ANSI C63.10 (2013) Section 6.8	47 CFR Part 15, Subpart C 15.225(e)	RSS-Gen Section 8.11	Pass	A
Radiated Emissions (9kHz-30MHz)		ANSI C63.10 (2013) Section 6.4&6.5	47 CFR Part 15, Subpart C 15.225(d) & 15.209	RSS-Gen Section 8.9	Pass	A
Radiated Emissions (30MHz-1GHz)		ANSI C63.10 (2013) Section 6.4&6.5	47 CFR Part 15, Subpart C 15.225(d) & 15.209	RSS-Gen Section 8.9	Pass	A

Declaration of EUT Family Grouping:

Note: There are series models mentioned in this report, and they are identical in electrical and electronic characters. Only the model UTK-3000 was tested since their differences were the model number and appearance.

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4 General Information

4.1 Details of E.U.T.

Power supply:	Host Adapter: FSP120-AHAN3 Input: 100-240V~ 50/60Hz 2.0A Output: 12.0V 10.0A 120.0W Printer Adapter1: GM60-240250-F Input: 100-240V~ 50/60Hz 2.0A Output: 24.0V 2.5A 60.0W Printer Adapter2: AP152G-240200 Input: 100-240V~ 50/60Hz 2.0A Max Output: 24.0V 2.0A 48.0W Printer Adapter3: GM53-240200-F Input: 100-240V~ 50/60Hz 2.0A Output: 24.0V 2.0A 48.0W
S/N:	KSA7062996
Firmware Version:	RTLWlanE_WindowsDriver_2024.0.10.130_Drv_3.00.0036_Win10.L
Test Voltage:	AC 120V/60Hz (Pre-test AC 230V/50Hz&AC 110V/60Hz then choose the AC 120V/60Hz as worst case)
Operation Frequency:	13.56MHz
Modulation Type:	ASK
Number of Channels	1
Antenna Type	Loop antenna

Note1: EUT has three different types of adapters: Adapter 1 (GM60-240250-F), Adapter 2 (AP152G-240200), and Adapter 3 (GM53-240200-F), all of which are pre-tested. Adapter1 is identified as the worst-case scenario, and only the worst-case results are reflected in the report.

Note2: The EUT comes with three different display sizes: Display 1 (UTK-3241KP), Display 2 (UTK-3321KP), and Display 3 (GUTK-3271KP), all of which are pre-tested. The display1 is identified as worst-case and only worst-case results are reflected in the report.

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
The EUT has been tested as an independent unit.			

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-8}
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
8	RF Radiated Power	5.2dB (Below 1GHz) 5.9dB (Above 1GHz)
9	Radiated Spurious Emission Test	4.2dB (Below 30MHz) 4.5dB (30MHz-1GHz) 5.1dB (1GHz-18GHz) 5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.4 Test Location

Lab A:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

Lab B:

Conducted Emissions at AC Power Line (150kHz-30MHz) test at:

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.

South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu)

Pilot Free Trade Zone

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).
3. Sample source: sent by customer.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

Lab A:

• **A2LA**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• **FCC**

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

• **ISED**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 2324E

• **VCCI**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

Lab B:

• **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Lab A:

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
RF Conducted Test						
1	Spectrum Analyzer	Keysight	N9020A	KUS1911E004-2	08/24/2024	08/23/2025
2	Spectrum Analyzer	Keysight	N9020A	KUS2001M001-2	08/24/2024	08/23/2025
3	Spectrum Analyzer	Keysight	N9030B	KSEM021-1	01/15/2024	01/14/2025
4	Signal Generator	R&S	SMBV100B	KSEM032	03/19/2024	03/18/2025
5	Signal Generator	R&S	SMW200A	KSEM020-1	08/24/2024	08/23/2025
6	Signal Generator	Agilent	N5182A	KUS2001M001-1	08/24/2024	08/23/2025
7	Radio Communication Test Station	Anritsu	MT8000A	KSEM001-1	08/24/2024	08/23/2025
8	Radio Communication Analyzer	Anritsu	MT8821C	KSEM002-1	03/19/2024	03/18/2025
9	Universal Radio Communication Tester	R&S	CMW500	KUS1911E004-1	08/24/2024	08/23/2025
10	Switcher	TST	FY562	KUS2001M001-4	01/15/2024	01/14/2025
11	AC Power Source	EXTECH	6605	KS301178	N.C.R	N.C.R
12	DC Power Supply	Agilent	E3632A	KS301180	N.C.R	N.C.R
13	Conducted Test Cable	Thermax	RF01-RF04	CZ301111-CZ301120	01/15/2024	01/14/2025
14	Temp. / Humidity Chamber	TERCHY	MHK-120AK	KS301190	08/24/2024	08/23/2025
15	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-5	03/19/2024	03/18/2025
16	Software	BST	TST-PASS	/	NCR	NCR

Lab B:

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
Conducted Emission at Mains Terminals						
1	Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2/1/2024	1/31/2025
2	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-06	2/8/2024	2/7/2025
3	Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-03	2/4/2024	2/3/2025
4	Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-04	2/4/2024	2/3/2025
5	Measurement Software	Tonscend	JS32-CE	SUWI-02-09-05	NCR	NCR

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

6.1.2 Conclusion

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is Loop antenna and no consideration of replacement.

Antenna location: Refer to internal photos.

7 Radio Spectrum Matter Test Results

7.1 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215

Test Method: ANSI C63.10 (2013) Section 6.9

Measurement Distance: 3m

7.1.1 E.U.T. Operation

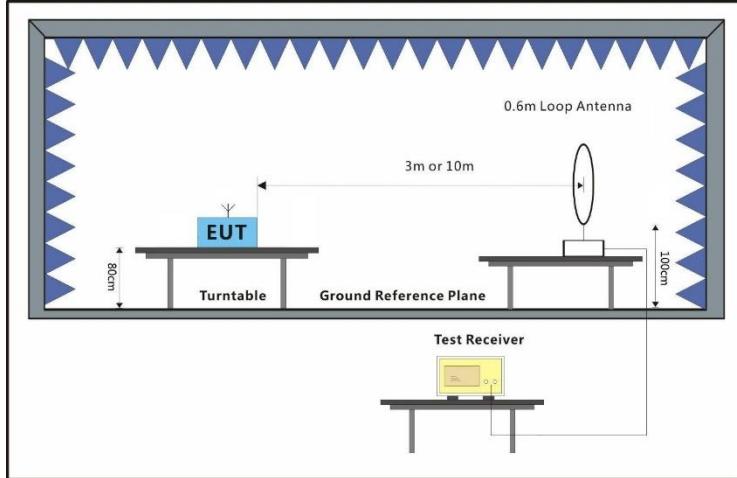
Operating Environment:

Temperature: 20.5 °C Humidity: 47.2 % RH Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	08	TX mode with modulation

7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

Please Refer to Appendix for Details

7.2 99% Bandwidth

Test Requirement RSS-Gen Section 6.7
Test Method: RSS-Gen March 2019 Amendment 1 Section 6.7

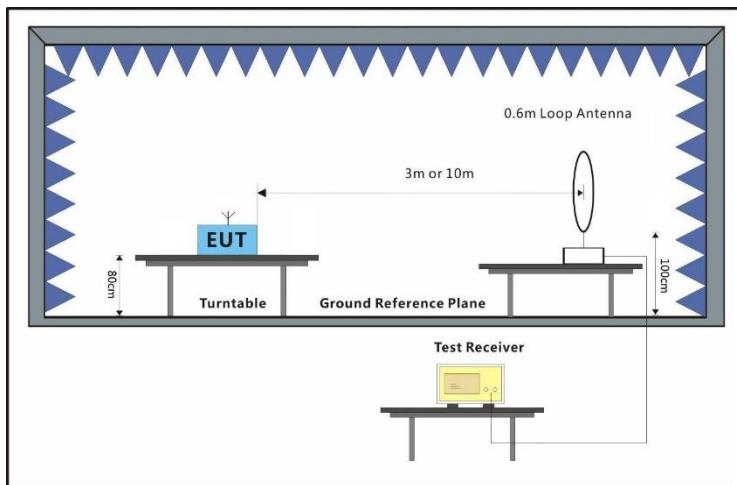
7.2.1 E.U.T. Operation

Operating Environment:
Temperature: 20.5 °C Humidity: 47.2 % RH Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	08	TX mode with modulation

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

Please Refer to Appendix for Details

7.3 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Measurement Distance: 3m

Limit:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

7.3.1 E.U.T. Operation

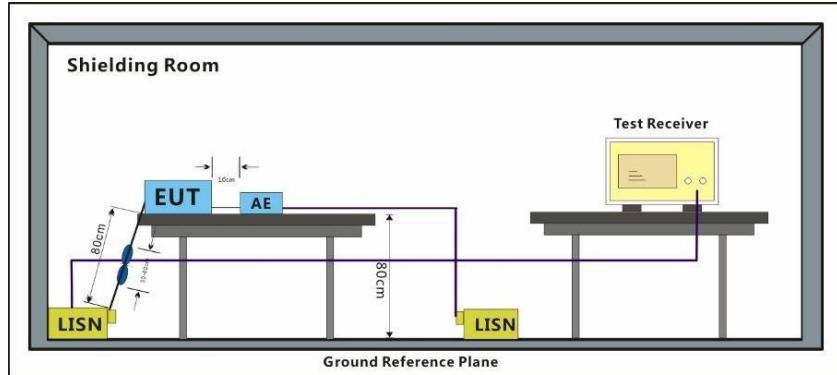
Operating Environment:

Temperature: 20.5 °C Humidity: 47.2 % RH Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	08	TX mode with modulation

7.3.3 Test Setup Diagram

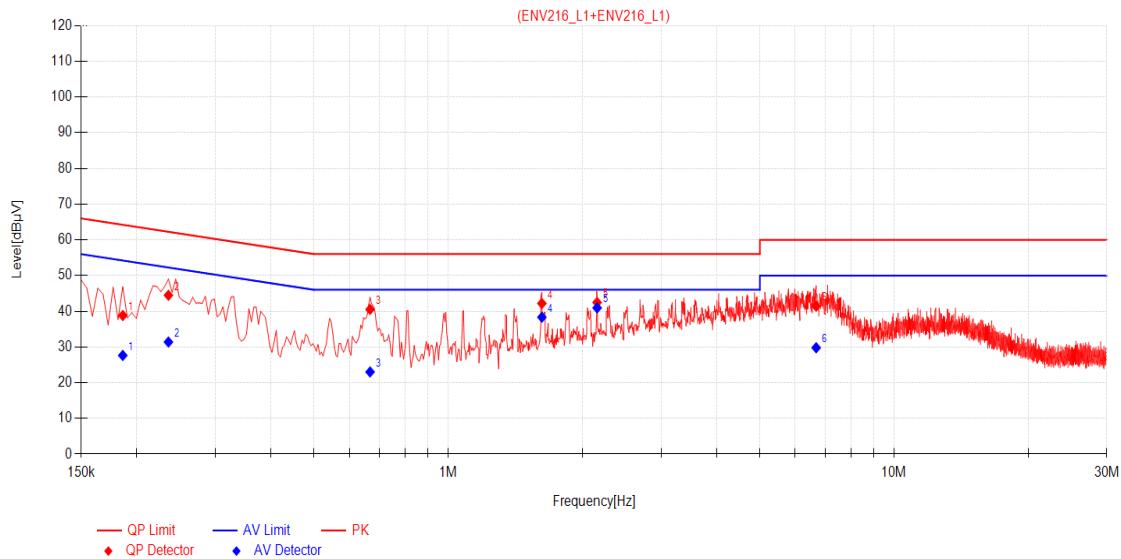


7.3.4 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50 μ H + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

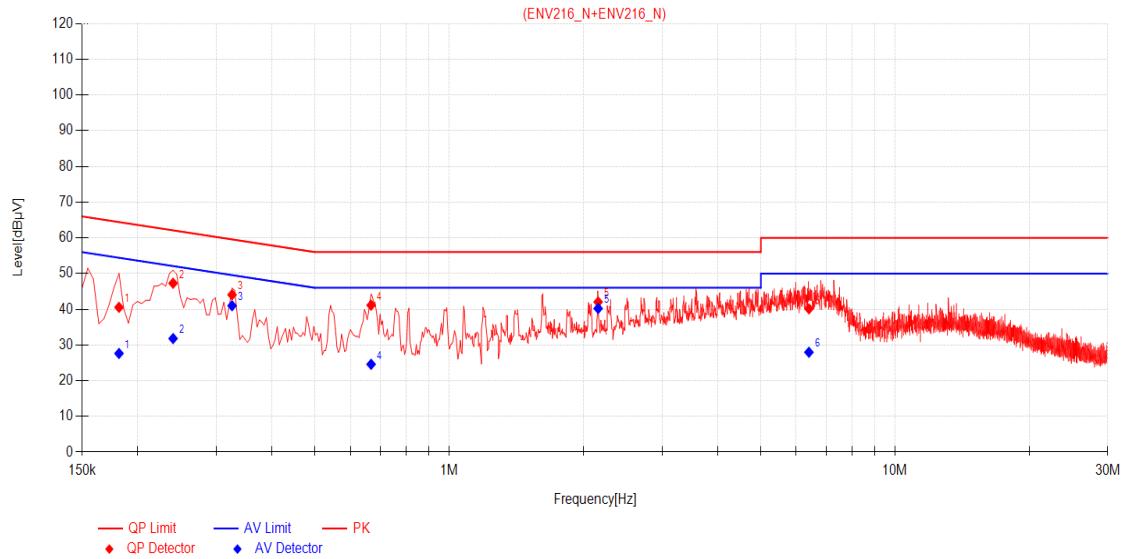
Remark: Level=Read Level+ Cable Loss+ LISN Factor

Test Mode: 08; Polarity: Horizontal



Final Data List											
NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBuV]	QP Value	QP Limit	QP Margin	AV Reading [dBuV]	AV Value	AV Limit	AV Margin	Verdict
1	0.1860	10.18	28.63	38.81	64.21	25.40	17.46	27.64	54.21	26.57	PASS
2	0.2355	10.16	34.32	44.48	62.25	17.77	21.22	31.38	52.25	20.87	PASS
3	0.6675	10.21	30.32	40.53	56.00	15.47	12.80	23.01	46.00	22.99	PASS
4	1.6215	10.08	32.11	42.19	56.00	13.81	28.24	38.32	46.00	7.68	PASS
5	2.1570	10.05	32.42	42.47	56.00	13.53	30.90	40.95	46.00	5.05	PASS
6	6.6885	10.09	31.35	41.44	60.00	18.56	19.69	29.78	50.00	20.22	PASS

Test Mode: 08; Polarity: Vertical



Final Data List											
NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBuV]	QP Value	QP Limit	QP Margin	AV Reading [dBuV]	AV Value	AV Limit	AV Margin	Verdict
1	0.1815	10.19	30.36	40.55	64.42	23.87	17.43	27.62	54.42	26.80	PASS
2	0.2400	10.16	37.13	47.29	62.10	14.81	21.64	31.80	52.10	20.30	PASS
3	0.3255	10.16	33.91	44.07	59.57	15.50	30.83	40.99	49.57	8.58	PASS
4	0.6675	10.22	30.91	41.13	56.00	14.87	14.37	24.59	46.00	21.41	PASS
5	2.1570	10.12	31.91	42.03	56.00	13.97	30.10	40.22	46.00	5.78	PASS
6	6.4095	10.10	30.03	40.13	60.00	19.87	17.86	27.96	50.00	22.04	PASS

7.4 Emission Mask

Test Requirement 47 CFR Part 15, Subpart C 15.225(a)&(b)&(C)

Test Method: ANSI C63.10 (2013) Section 6.4

Measurement Distance: 3m

Limit:

- (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

Below 30MHz

The limit at 30m test distance is below:

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

where

FS_{limit} is the calculation of field strength at the limit distance, expressed in dB μ V/m
 FS_{max} is the measured field strength, expressed in dB μ V/m
 d_{measure} is the distance of the measurement point from the EUT
 d_{limit} is the reference distance or the distance of the $\lambda/2\pi$ point

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 84dB μ V/m at 30 meters.

7.4.1 E.U.T. Operation

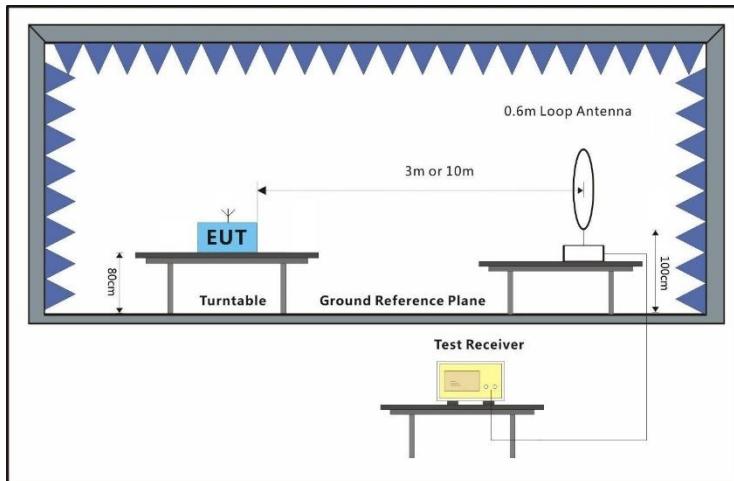
Operating Environment:

Temperature: 20.5 °C Humidity: 47.2 % RH Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	08	TX mode with modulation

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

Remark: The test level of the fundamental signal is below the limit of general spurious emission, so the test item doesn't be performed.

7.5 Frequency tolerance

Test Requirement 47 CFR Part 15, Subpart C 15.225(e)

Test Method: ANSI C63.10 (2013) Section 6.8

Measurement Distance: 3m

Limit: ± 0.01

7.5.1 E.U.T. Operation

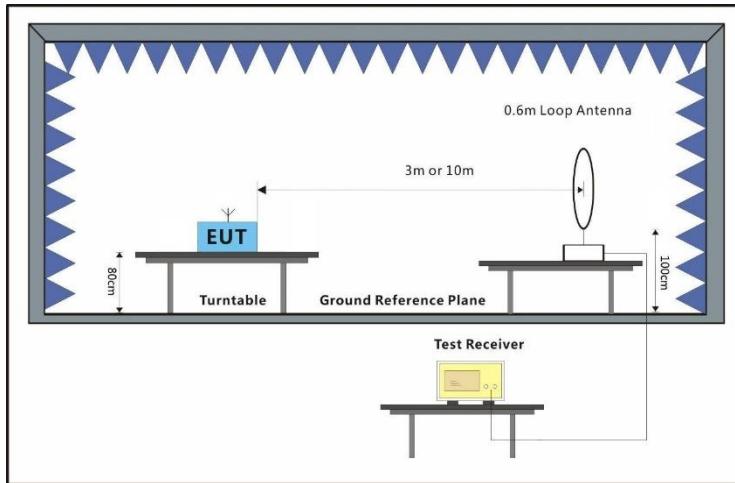
Operating Environment:

Temperature: 20.5 °C Humidity: 47.2 % RH Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	08	TX mode with modulation

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

The EUT was placed in an environmental test chamber and powered such that control element received normal voltage and the transmitter provided maximum RF output.

Please Refer to Appendix for Details

7.6 Radiated Emissions (9kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.225(d) & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4&6.5

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Limit (dBuV/m)	Detector	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	-	300
0.490-1.705	24000/F(kHz)	-	-	30
1.705-30	30	-	-	30

Below 30MHz

If field strength is measured at only a single point, then that point shall be at the radial from the EUT that produces the maximum emission at the frequency being measured, as described in 5.4. If that point is closer to the EUT than $\lambda/2\pi$ and the limit distance is greater than $\lambda/2\pi$, the measurement shall be extrapolated to the limit distance by conservatively presuming that the field strength decreases at a 40 dB/decade of distance rate to the $\lambda/2\pi$ distance, and at a 20 dB/decade of distance rate beyond $\lambda/2\pi$. This shall be accomplished using Equation (2):

$$FS_{(10m)} = FS_{(30/300m)} + 40\log\{d_{(near field)}/d_{(10m)}\} + 20\log\{d_{(30/300m)}/d_{(near field)}\} \quad (2)$$

If the single point measured is at a distance greater than $\lambda/2\pi$, then extrapolation to the limit distance shall be calculated using Equation (3):

$$FS_{(10m)} = FS_{(30/300m)} + 20\log\{d_{(30/300m)}/d_{(10m)}\} \quad (3)$$

If both the single point and the limit distance are equal to or closer to the EUT than $\lambda/2\pi$, then extrapolation to the limit distance shall be calculated using Equation (4):

$$FS_{(10m)} = FS_{(30/300m)} + 40\log\{d_{(30/300m)}/d_{(10m)}\} \quad (4)$$

Remark:

$$d_{near field} = 47.77 / f_{MHz}$$

where f_{MHz} is the frequency of the emission being measured in MHz.

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

where

FS_{limit} is the calculation of field strength at the limit distance, expressed in $\text{dB}\mu\text{V/m}$
 FS_{max} is the measured field strength, expressed in $\text{dB}\mu\text{V/m}$
 d_{measure} is the distance of the measurement point from the EUT
 d_{limit} is the reference distance or the distance of the $\lambda/2\pi$ point

7.6.1 E.U.T. Operation

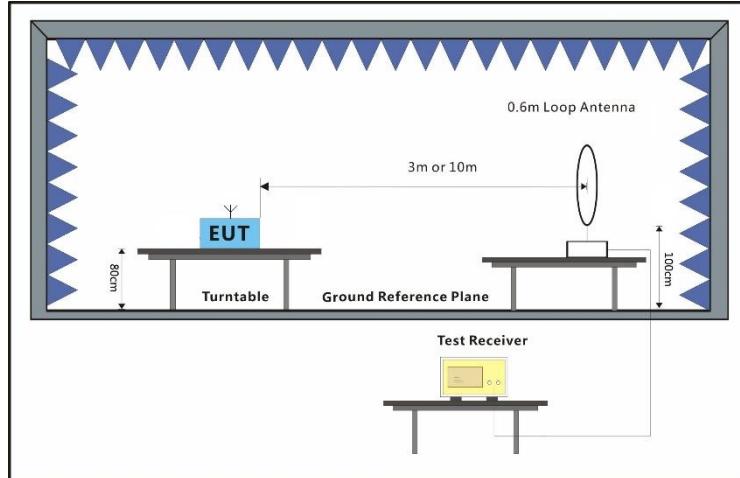
Operating Environment:

Temperature: 20.5 °C Humidity: 47.2 % RH Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	08	TX mode with modulation

7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

Please Refer to Appendix for Details

7.7 Radiated Emissions (30MHz-1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.225(d) & 15.209
 Test Method: ANSI C63.10 (2013) Section 6.4&6.5
 Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands above 1000 MHz. Radiated emission limits in these three bands (9-90kHz, 110-490kHz and Above 1GHz) are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

7.7.1 E.U.T. Operation

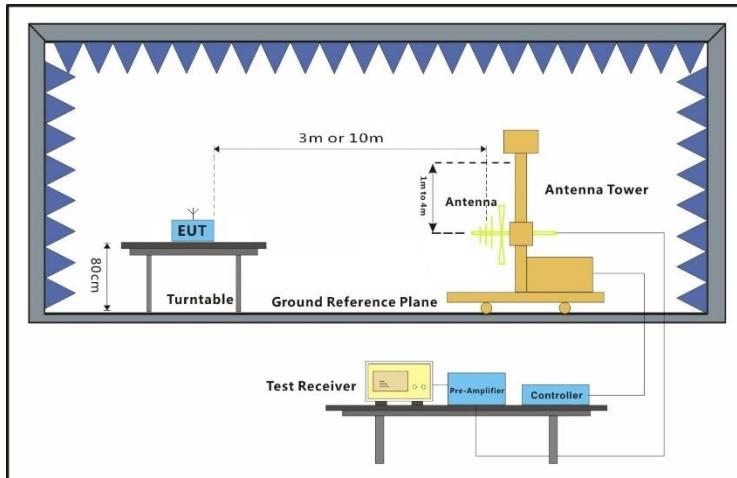
Operating Environment:

Temperature: 20.5 °C Humidity: 47.2 % RH Atmospheric Pressure: 1010 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	08	TX mode with modulation

7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Please Refer to Appendix for Details

8 Test Setup Photo

Refer to Appendix - Test Setup Photo for KSCR2412002452AT

9 EUT Constructional Details (EUT Photos)

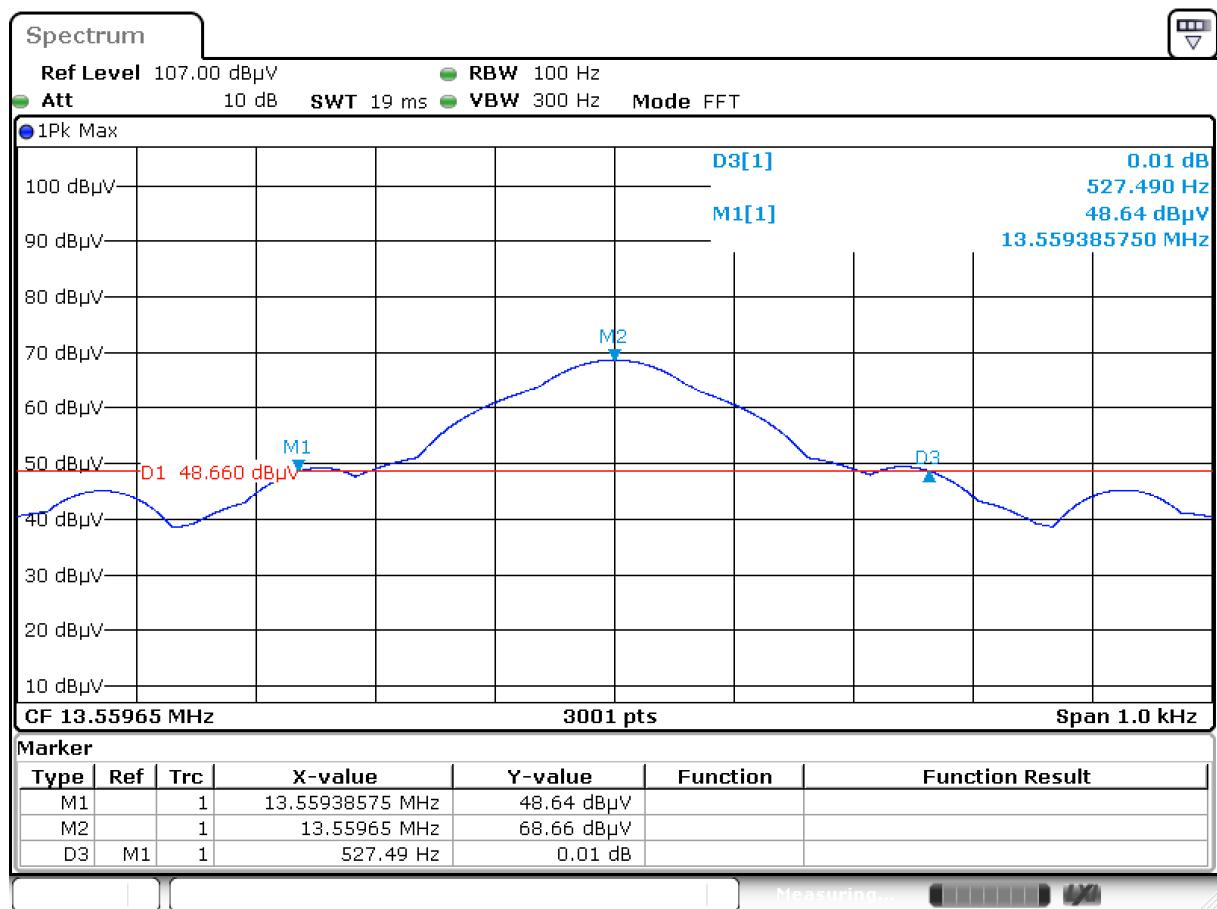
Refer to Appendix_Photos of EUT Constructional Details for KSCR2412002452AT

10 Appendix

10.1 20dB Bandwidth

20dB bandwidth (kHz)	F _L (MHz)	F _H (MHz)	Limit(MHz)	Result
0.52749	13.55939	13.55991	13.110 – 14.010	Pass

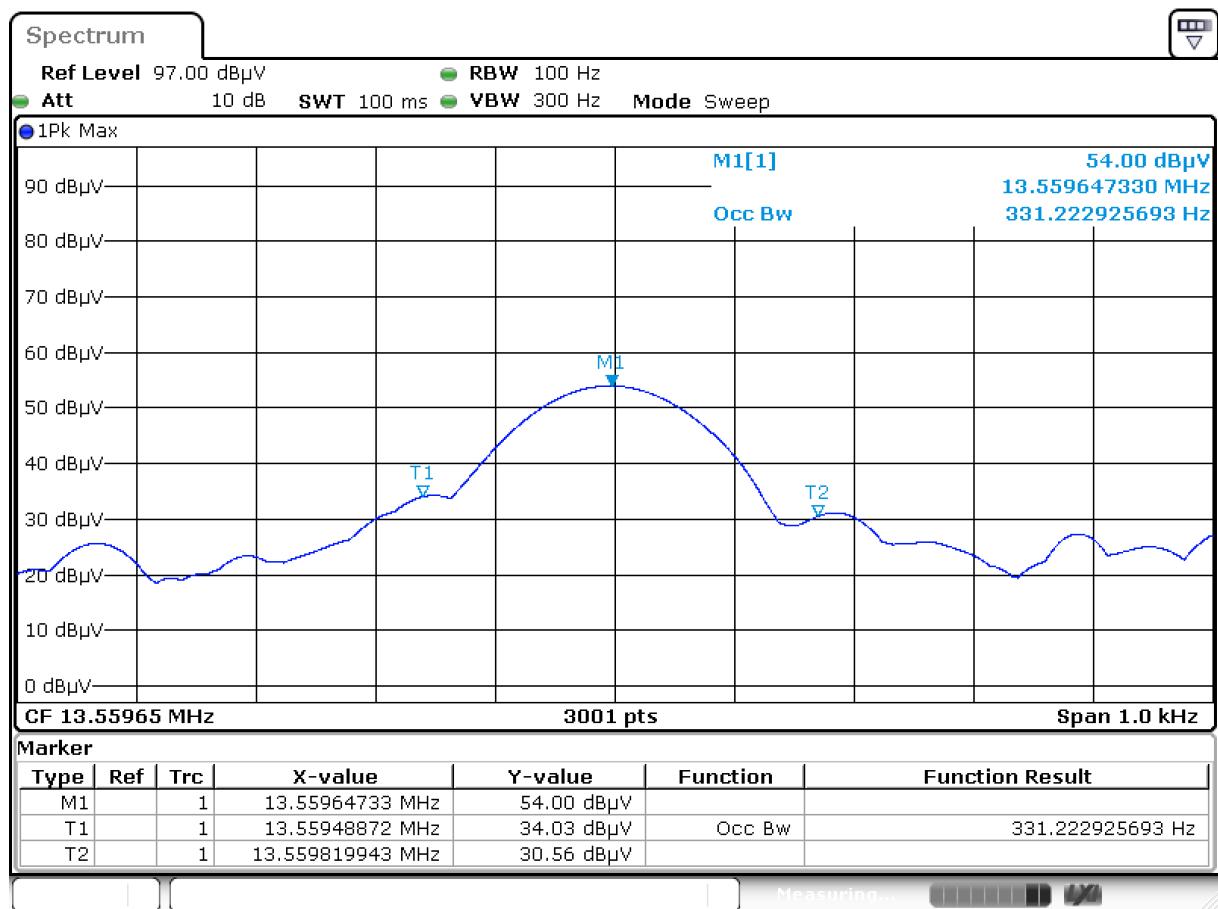
Test plot as follows:



10.2 99% Bandwidth

99% bandwidth (kHz)	F _L (MHz)	F _H (MHz)	Limit(MHz)	Result
0.33122	13.55949	13.55982	13.110 – 14.010	Pass

Test plot as follows:



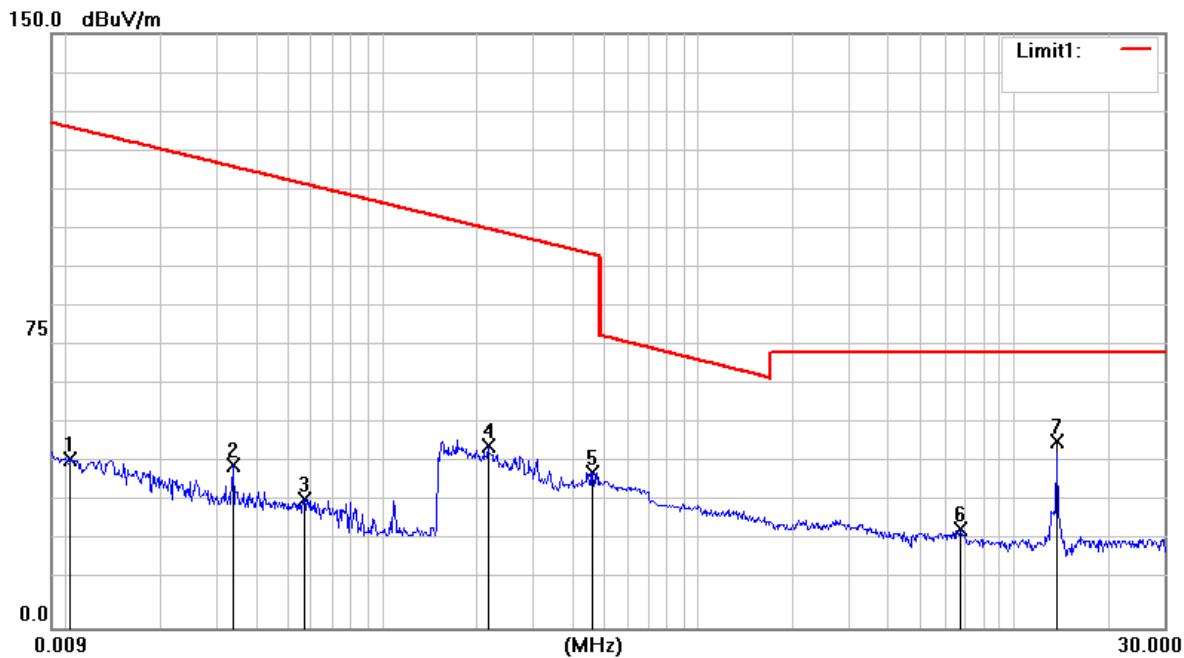
10.3 Frequency tolerance

Nominal Operation Frequency: 13.56MHz

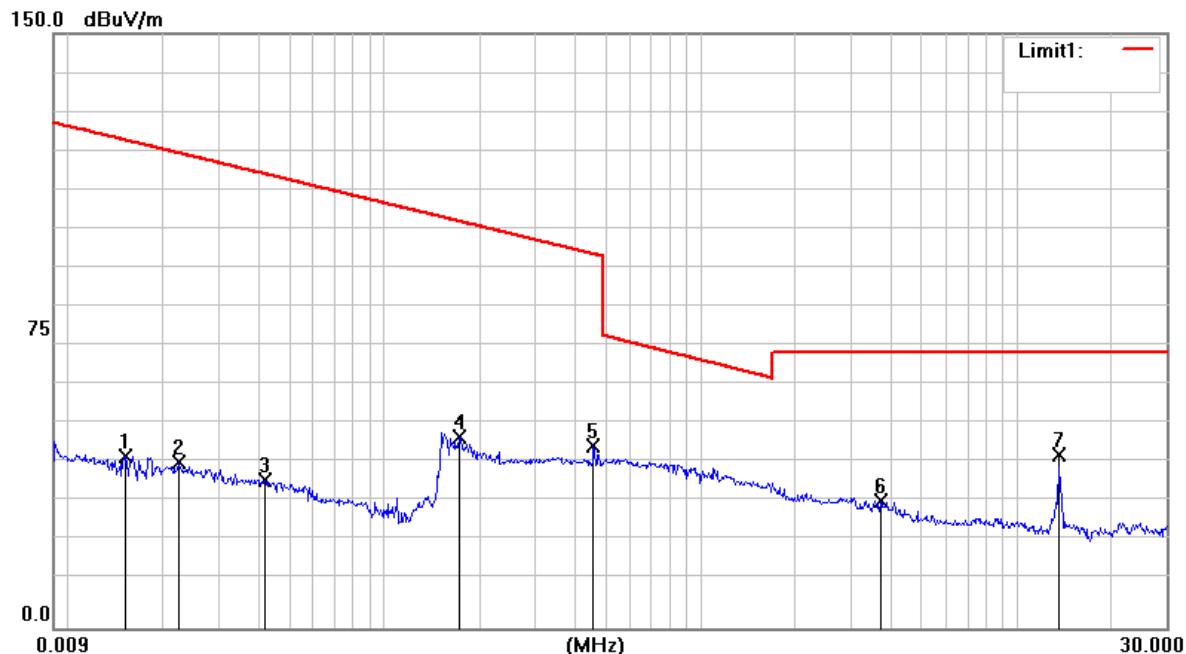
Test Conditions		Test Result (MHz)	Deviation (kHz)	Limit (kHz)	Result
Temp (°C)	Volt (V AC)				
T _{nom} (-20)	V _{nom} (120)	13.55963	-0.37	$\pm 0.01\%$ (1.3560kHz)	Pass
T _{nom} (-10)	V _{nom} (120)	13.55967	-0.33		Pass
T _{nom} (0)	V _{nom} (120)	13.55965	-0.35		Pass
T _{nom} (10)	V _{nom} (120)	13.55964	-0.36		Pass
T _{nom} (20)	V _{nom} (120)	13.55965	-0.35		Pass
T _{nom} (30)	V _{nom} (120)	13.55964	-0.36		Pass
T _{nom} (40)	V _{nom} (120)	13.55965	-0.35		Pass
T _{nom} (50)	V _{nom} (120)	13.55962	-0.38		Pass
T _{nom} (20)	V _{min} (102)	13.55964	-0.36		Pass
	V _{max} (138)	13.55965	-0.35		Pass

Note: Deviation (kHz) = (Test Result-13.56MHz)*1000

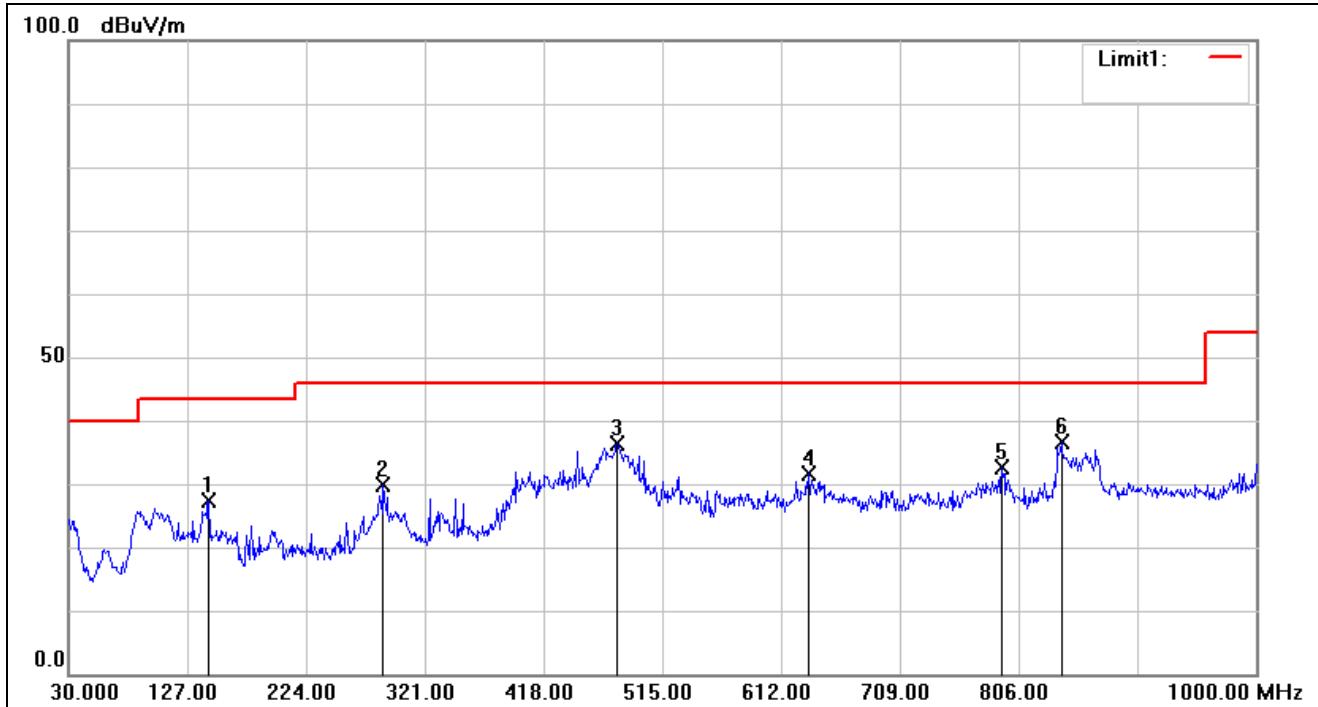
10.4 Radiated Emissions(9kHz-30MHz)



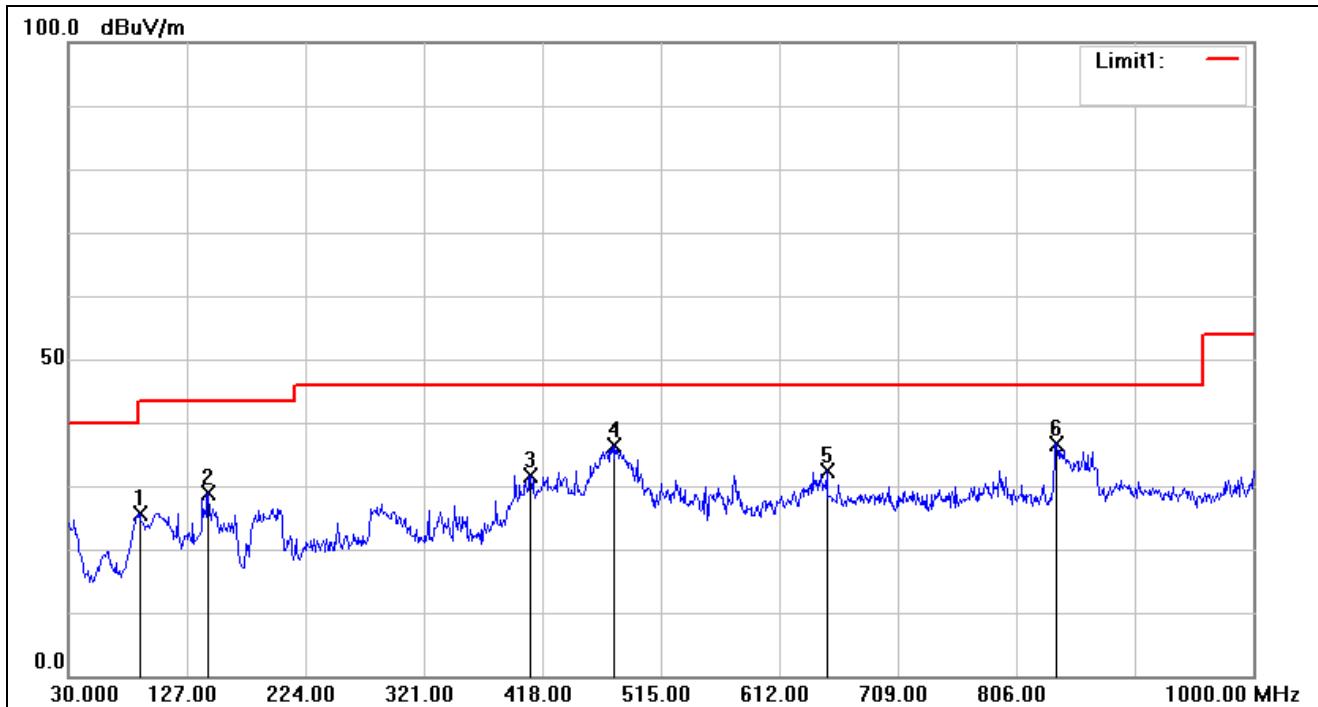
Item	Freq.	Read Level	Correct Factor	Result Level@3 m	Result Level@S PEC	Limit Line@SPEC	Over Limit	Detector	Polarity
(Mark)	(MHz)	(dB μ V)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)		
1	0.0103	22.56	19.90	42.46	126.37	-83.91	0.0103	QP	Coaxial
2	0.0337	21.06	19.97	41.03	116.37	-75.34	0.0337	QP	Coaxial
3	0.0565	12.35	20.03	32.38	112.02	-79.64	0.0565	QP	Coaxial
4	0.2162	25.50	20.30	45.80	100.70	-54.90	0.2162	QP	Coaxial
5	0.4611	19.05	20.30	39.35	94.31	-54.96	0.4611	QP	Coaxial
6	6.7690	4.59	20.33	24.92	69.50	-44.58	6.7690	QP	Coaxial
7	13.6227	26.87	20.35	47.22	69.50	-22.28	13.6227	Peak	Coaxial



Item	Freq.	Read Level	Correct Factor	Result Level@3 m	Result Level@S PEC	Limit Line@SP EC	Over Limit	Detector	Polarity
(Mark)	(MHz)	(dB μ V)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)		
1	0.0151	23.28	19.92	43.20	123.14	-79.94	0.0151	QP	Coplanar
2	0.0222	21.78	19.94	41.72	119.89	-78.17	0.0222	QP	Coplanar
3	0.0420	17.38	19.99	37.37	114.52	-77.15	0.0420	QP	Coplanar
4	0.1711	27.91	20.30	48.21	102.67	-54.46	0.1711	QP	Coplanar
5	0.4586	25.77	20.30	46.07	94.36	-48.29	0.4586	QP	Coplanar
6	3.7198	11.88	20.31	32.19	69.50	-37.31	3.7198	QP	Coplanar
7	13.6227	23.47	20.35	43.82	69.50	-25.68	13.6227	Peak	Coplanar

10.5 Below 1GHz

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
1	144.4600	14.19	13.29	27.48	43.50	-16.02	QP	Horizontal
2	287.0500	14.30	15.64	29.94	46.00	-16.06	QP	Horizontal
3	478.1400	16.16	20.11	36.27	46.00	-9.73	QP	Horizontal
4	634.3100	8.27	23.31	31.58	46.00	-14.42	QP	Horizontal
5	792.4200	30.33	2.26	32.59	46.00	-13.41	QP	Horizontal
6	840.9200	34.39	2.16	36.55	46.00	-9.45	QP	Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Polarity
1	88.2000	14.32	11.38	25.70	43.50	-17.80	QP	Vertical
2	144.4600	15.52	13.29	28.81	43.50	-14.69	QP	Vertical
3	408.3000	13.33	18.20	31.53	46.00	-14.47	QP	Vertical
4	477.1700	16.22	20.06	36.28	46.00	-9.72	QP	Vertical
5	650.8000	9.04	23.45	32.49	46.00	-13.51	QP	Vertical
6	838.9800	34.48	2.17	36.65	46.00	-9.35	QP	Vertical

- End of the Report -